United States Department of the Interior

NATIONAL PARK SERVICE
Grand Canyon National Park
P.O. Box 129
Grand Canyon, Arizona 86023-0129

IN REPLY REFER TO:

Subject: Public Review of Environmental Assessment –Upgrade of North Rim Concessioners Recreational Vehicle Park and Construction of 44 Unit Dormitory.

Dear Interested Party:

Grand Canyon National Park proposes to upgrade and expand the existing concessioner recreational vehicle (RV) park and construct a new 44-unit dormitory on the North Rim in the area set aside for concessioner housing and the Employee Dining Room (EDR). The proposal to undertake the Action Alternative will provide critically needed housing for Park employees on the North Rim.

This Environmental Assessment evaluates two Alternatives for addressing the purpose and need for action, including a No Action Alternative and an Action Alternative. The Action Alternative includes removal of 6 Ponderosa Pine trees, 5 dead aspen trees and additional disturbance of approximately 3-4 acres of land previously disturbed by vehicular and foot traffic. No threatened or endangered species of plants or animals or their habitat would be affected.

The Action Alternative would not have measurable impacts to cultural resources, threatened or endangered species, air quality, soundscape, floodplains and wetlands, environmental justice, prime and unique farmland, socioeconomic environment, or visitor experience. The Action Alternative would result in negligible to minor adverse impacts to soils and water, negligible to moderate adverse impact to vegetation and moderate long-term beneficial impacts to Park/concessioner operations.

An Environmental Assessment (EA) has been prepared for this project and is enclosed for your review. A general scoping letter soliciting comments on the initial proposal was sent out in July 2001. If you wish to comment on this EA, you may mail your comments to the Superintendent, Grand Canyon National Park, Attn: Sara White, Environmental Compliance Officer, P.O. Box 129, Grand Canyon, AZ 86023, or email Sara White, at sara_white@nps.gov no later than **July 15, 2003.**

Please be aware that names and addresses of respondents may be released if requested under the Freedom of Information Act. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold from the record a respondent's identity, as allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

If you have any questions regarding the project, please call Sara White at (928) 638-7956. This EA is also available on Grand Canyon National Park's website at http://www.nps.gov/grca/compliance.

Sincerely,

Joseph F. Alston
Superintendent

Enclosure

cc:
Jill Beshears, w/o enc.
Allen Keske, w/o enc.

Grand Canyon National Park,
North Rim

North Rim Concessioner RV Park Upgrade and New Dormitory

Environmental Assessment

May 2003

Environmental Assessment

North Rim Concessioner RV Park Upgrade and New Dormitory

Grand Canyon National Park • Arizona

Summary
Grand Canyon National Park proposes to upgrade and expand the existing concessioner recreational vehicle (RV) park and construct a new 44-unit dormitory on the North Rim in the area set aside for concessioner housing and the Employee Dining Room (EDR). The proposal to undertake the Action Alternative will provide critically needed housing for Park employees on the North Rim.

This Environmental Assessment evaluates two Alternatives for addressing the purpose and need for action, including a No Action Alternative and an Action Alternative. The Action Alternative includes removal of 6 Ponderosa Pine trees, 5 dead aspen trees and additional disturbance of approximately 3-4 acres of land previously disturbed by vehicular and foot traffic. No threatened or endangered species of plants or animals or their habitat would be affected.

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Public Comment
This environmental assessment will be on public review for 30 days. If you wish to comment on the environmental assessment, you may mail comments to the name and address below, no later than **July 15, 2003** . Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Please Address Comments to:

Joseph F. Alston, Superintendent
Attention: Sara White, Environmental Compliance Officer
Grand Canyon National Park
P.O. Box 129
1 Village Loop
Grand Canyon, Arizona 86023

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Chapter 1- PURPOSE AND NEED FOR ACTION

INTRODUCTION

This environmental assessment (EA) was prepared in accordance with the regulations of the Council on Environmental Policy Act (CEQ) (40 CFR 1500 et seq.) and in part 516 of the U.S. Department of the Interior's Departmental Manual (516 DM).

The National Environmental Policy Act (NEPA) is the basic national charter for environmental protection; among other actions it calls for an examination of the impacts on the components of affected ecosystems. The 1995 GMP, 2001 NPS Management Policies, NPS-77 (Natural Resources Management), DO-12 (Director's Orders) among other National Park Service (NPS) and Park policies, provides general direction for the protection of the natural abundance and diversity of the Park's naturally occurring communities.

This environmental assessment provides disclosure of the planning and decision-making process and potential environmental consequences of the Alternatives on the human environment. The human environment is defined as the natural and physical environment and the relationship of people with that environment. The analysis of environmental consequences was prepared on the basis of a need to adequately analyze and understand the consequences of the impacts related to the proposed Park developments and to involve the public and other agencies in the decision-making process. In implementing this proposal, the NPS would comply with all applicable laws and executive orders.

PURPOSE AND NEED

Grand Canyon National Park (GRCA) proposes to rehabilitate and expand the existing concessioner Recreational Vehicle (RV) park and construct a new 44-unit concessioner dormitory for the most part on disturbed land immediately adjacent to the RV park on the North Rim of the Park within Coconino County, Arizona. This proposal implements the intent of the *1995 General Management Plan* (GMP) for GRCA by providing critically needed housing for concessioner employees. The lack of available housing for NPS and concessioner employees has led to a critical shortage of mandatory staff to service the needs of the visiting public. Years of intensive use have lead to the need for rehabilitation of a number of the parking pads in the RV park. Impacted areas both within and immediately adjacent to the RV park will also be utilized to develop new spaces for several additional RV units. The development of a 44-unit dormitory in the vicinity of the concessioner dining facility, housing area, and RV park will provide required housing in a disturbed area set aside for housing and removed from public access and visibility.

MANAGEMENT AND PLANNING HISTORY

Grand Canyon National Park is currently operating under the direction of the *1995 General Management Plan* (GMP). This plan provides guidance for resource management, visitor use, and general development for a period of 10 to 15 years. The management objectives for Grand Canyon National Park, which are based on the Park vision, set the direction for future Park management. The GMP (page 47) directs the Park to provide approximately 270 housing units on the North Rim to be constructed in existing disturbed areas to replace substandard units and units converted to visitor lodging. The units will be designed to blend with the character and environment of the North Rim.

In August 2000, an interdisciplinary team made up of Grand Canyon National Park staff, concessioner representatives, the Arizona State Historic Preservation Officer (SHPO) and NPS Denver Service Center environmental, design, and planning staff met on the North Rim. The team reviewed proposed Alternatives for projects, including the upgrading of the RV park and the development of a new employee dormitory. During the weeklong on-site visit, this diverse team evaluated potential sites for the proposed dormitory and assessed the conditions in and around the RV park. The proposed activities were discussed at great length and addressed issues and impacts to the environment that might occur due to implementation. Sites were identified based on least environmental impact due to construction. The projects were reviewed again by the Parkwide Interdisciplinary Team in March and April 2002 and an interdisciplinary team again evaluated the projects on-site in August 2002.

NPS staff met with personnel from United States Fish and Wildlife Service (USFWS) and Arizona Game and Fish Department (AGFD) on December 13, 2000 to discuss this project proposal and other future proposals. NPS staff met with USFWS several times between March and June 2002 to discuss this project proposal in conjunction with a batch consultation for various construction projects throughout the Park. Concurrence on the batch consultation was received from USFWS on July 9, 2002 and indicated that the projects may affect but are not likely to adversely affect the Mexican spotted owl and the California condor.

A notification and short article on North Rim project proposals was published in the Williams/Grand Canyon newspaper, in the January 3-9, 2001 edition. Official public scoping was initiated on July 17, 2001 for a 30-day period. Affected agencies, affiliated tribes and the State Historic Preservation Office (SHPO) were also sent a scoping letter. The North Rim projects public scoping was a topic of discussion at several of the monthly GRCA community meetings held at the Park between January and July. Six comments were received concerning the proposed RV park upgrades and new dormitory. On the whole, comments were in favor of the Proposed Action. No negative comments were received.

The proposed actions analyzed in this EA and their potential cumulative effects have been discussed at several Parkwide Interdisciplinary Team (PIDT) meetings. Project specifics and cumulative impact discussions were further discussed at PIDT meetings in August, September, and November 2002 and in the spring of 2003. Discussions with the PIDT were held in part to determine the level of analysis needed, cumulative impact methodology and adequacy of cumulative impact information.

This EA incorporates by reference and tiers to the *General Management Plan Environmental Impact Statement* (July 1995).

IMPACT TOPICS

Various agencies have been contacted and consulted as part of this planning and environmental analysis effort. Appropriate federal, state, and local agencies have been contacted for input and review in coordination with other legislative and executive requirements. National Park Service specialists, with input from federal, state, and local agencies identified issues and concerns (i.e. impact topics) affecting this project. An "issue" is an effect on a physical, biological, social, or economic resource. The predicted effects of an activity create the issue. Issues may come from the public, from within an agency or department, or from another agency (Freeman and Jenson 1998). After public scoping, issues and concerns were distilled into distinct impact topics to

facilitate the analysis of environmental consequences, which allows for a standardized comparison between Alternatives based on the most relevant information.

Impact Topics Analyzed

Soils and Water

Proposed activities would involve minimal soil disturbance due to grading for the new dormitory and new RV parking pads. The area has been impacted by previous vehicular and foot traffic and the project is of limited scope and extent, however, this topic will be analyzed in this document.

Vegetation

Proposed activities would involve minimal disturbance of vegetative communities within an approximately 4 acre area and removal of 6 live trees. Proposed construction activities could create conditions favorable to exotic vegetation and noxious weeds. Mitigation measures would be implemented to prevent the import or spread of exotic vegetation or noxious weeds. This topic will be analyzed in this document.

Wildlife and Special Status Species

Proposed activities would involve limited disturbance of vegetative communities and could therefore disturb wildlife habitat. Habitat modification, as well as noise and other activities associated with project implementation have the potential to impact wildlife populations. In response to a request for a list of federally listed species in the project area, the U.S. Fish and Wildlife Service (USFWS) in a letter dated August 13, 2001, (USFWS Reference #2-21-01-I-386), provided a list of threatened, endangered and proposed species that have the potential to occur in Coconino County. The Arizona Game and Fish Department provided a list of special status species in a letter dated January 24, 2000. Representatives from both agencies also met to discuss this and other Park projects in December 2000, and also discussed multiple North Rim proposed projects during the preparation of the Parkwide Construction Program Batch Biological Assessment during March – June 2002 (NPS 2002). The information provided was used to develop a list of species of concern for this project. Section 7 of the Endangered Species Act requires all federal agencies to consult with the USFWS to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of the species or critical habitats. This topic will be analyzed in this document.

Park/Concessioner Operations

The Park/concessioner will realize a beneficial impact due to the provision of quarters that are more adequate to the needs of Park employees. This topic will be analyzed in this document.

Impact Topics Dismissed from Further Analysis

Geology and Topography

Alteration of geologic processes and features are not proposed in either of the Alternatives. No major earthmoving or blasting activities are proposed that would impact the geologic processes or features or cause substantial alteration of the topography. Therefore, this topic will not be analyzed in this document.

Threatened and Endangered Species: Fauna

Endangered Species Act of 1973, as amended (16 USC 1531 et seq.). Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats.

The U.S. Fish and Wildlife Service (USFWS), on December 14, 2000, provided a list of federally listed species in the project area, specifically those threatened, endangered, and proposed species that have the potential to occur in Coconino County. The Arizona Game and Fish Department provided a list of special status species in a letter dated January 24, 2000. Representatives from both agencies met to discuss this and other North Rim projects in December 2000. A 'batch' consultation was undertaken between GRCA staff and the USFWS during the spring of 2002 to access the impacts of several projects on the North Rim on Threatened and Endangered Species. It was determined via this consultation that there would be no impact to threatened and endangered species due to these proposed construction and rehabilitation activities. Therefore, this topic will not be analyzed in this document.

Threatened and Endangered Species: Flora

Threatened, Endangered, and Species of Concern – Plants. The U.S. Fish and Wildlife Service has determined that six federally listed proposed, threatened, or endangered plant species may occur or have habitat in the Grand Canyon area, Coconino County. These species are:

- Brady pincushion cactus (*Pediocactus bradyi*) – endangered.
- Navajo sedge (*Carex specuicola*) – threatened.
- San Francisco peaks groundsel (*Senecio franciscanus*) – threatened.
- Sentry milk-vetch (*Astragalus cremnophylax* var. *cremnophylax*) – endangered.
- Siler pincushion cactus (*Pediocactus sileri*) – threatened.
- Welshes milkweed (*Asclepias welshii*) – threatened.

The above federal and state listed species do not exist at the RV park or the adjacent location for the proposed 44-unit dormitory. This determination is based on site specific knowledge of the areas, reconnaissance of the areas, knowledge of the species in question, and professional judgement. There would be no effect on any of the federal or state listed plant species due to the fact they are not present. Therefore, this topic will not be analyzed in this document.

Cultural Resources

The National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq*.), and the National Environmental Policy Act, as well as the National Park Service's Director's Order-28, *Cultural Resource Management Guideline (1994*), *Management Policies* (2001), and Director's Order-12, *Conservation Planning, Environmental Impact Analysis and Decision-making* (2001), require the consideration of impacts on cultural resources either listed in or eligible to be listed in the National Register of Historic Places. Section 106 of the National Historic Preservation Act of 1966 requires that federal agencies having direct or indirect jurisdiction over undertakings

consider the effect of those undertakings on properties on, or eligible for listing on the National Register of Historic Places and afford the Advisory Council on Historic Preservation and the state historic preservation office an opportunity to comment.

Three historic districts on the North Rim are listed on the National Register of Historic Places. These include the Grand Canyon Inn (North Rim Inn) and Campground Historic District, the Grand Canyon North Rim Headquarters District, and the Grand Canyon Lodge Historic District, also designated as a National Historic Landmark. The proposed project area is not within any of the three historic districts on the North Rim. It lies ½ mile north of the Campground District and ½ mile south of the Headquarters District.

No work will take place within a National Historic Landmark District. One building between the Employee Dining Room and the RV park has been determined not to be eligible for listing on the National Register of Historic Places. There would be no affect to historic resources by the Action Alternative; therefore this topic will not be analyzed in this document.

Archaeological Resources

Consultations with American Indians are also required for compliance with a variety of laws and other legal entities, such as presidential executive orders, proclamations, and memoranda; federal regulations; and agency management policies and directives. Examples are the Indian self-determination and Education Assistance Act (1975); The American Indian Religious Freedom Act (1978 and as amended in 1994); the native American Graves Protection and Repatriation Act (1990); National Historic Preservation Act (as amended in 1992); the Presidential Memorandum of April 29, 1994, entitled "Government-to-Government Relations With Native American Tribal Governments"; and Executive Order 13007 of May 24, 1996, entitled "Indian Sacred Sites."

The North Rim has some of the most important archeological sites in the Park, especially in the Walhalla Glades area where surveys have located hundreds of sites (surveys were initially conducted in 1939, then in the 1960's, then in the early 1980's). Settlement history for the area reflects considerable occupation during AD 1050 to AD 1150 where intensive farming occurred during the summer for approximately 100 years. There are only three known archeological sites on the Bright Angel Peninsula, one being located along Transept Trail between Grand Lodge and the North Rim Campground. Archeological surveys were conducted in the project area over the last 20 years, with no additional sites being located (GRCA archeological clearance files). Native American use of the area is known in general terms from ethnographic accounts and on-going consultation with the nine affiliated tribes of Grand Canyon. No specific references have been identified specifically for the Bright Angel Peninsula area.

Although ground-disturbing activities have the potential to affect archeological resources, the proposed project sites have been surveyed and cleared for archaeological elements. Mitigation measures will be put in place in the event that archaeological elements are uncovered during site work. Therefore, this topic will not be analyzed in this document.

Ethnographic Resources

Ethnographic resources are defined by NPS as any "site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (*Cultural Resource Management Guideline* – DO-28: 191). The lands of Grand Canyon National Park are traditionally affiliated with the following Indian tribes: Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab-Paiute

Tribe, Navajo Nation, Paiute Indian Tribe of Utah, Pueblo of Zuni, White Mountain Apache and San Juan Southern Paiute Tribe.

The Grand Canyon has long been of importance to native cultures and figures prominently in the origin/religious beliefs and ceremonial practices of many groups. For example, traditional Hopi and Zuni beliefs hold the Grand Canyon as the sacred place from which their ancestors emerged to the present world (GMP 1995). Although ethnographic resources significant to Native Americans may be present in the vicinity of Bright Angel Peninsula, no ethnographic resources are known to exist within the area proposed for development (GMP 1995). Copies of this EA will be forwarded to each affiliated tribe for review and comment. If the tribes subsequently identify the presence of additional ethnographic resources within the project construction area, appropriate mitigation measures would be undertaken in consultation with the tribes. The location of any ethnographic sites would not be made public. As necessary, mitigation would be carried out in accordance with provisions of the Native American Graves Protection and Repatriation Act of 1990. Because there are no known ethnographic resources within the project area or general vicinity, ethnographic resources will not be analyzed in this document.

Soundscape

The NPS is mandated to the purpose of the Director's Order 47 to articulate the National Park Service's operational policies that will require, to the fullest extent practicable, the protection, maintenance, or restoration of the natural soundscape resource in a condition unimpaired by inappropriate or excessive noise sources. Natural sounds are intrinsic elements of the environment that are often associated with parks and park purposes. They are inherent components of "the scenery and the natural and historic objects and the wildlife" protected by the NPS Organic Act. Natural sounds are vital to the natural functioning of many parks, and may provide valuable indicators of the health of various ecosystems. Intrusive sounds are of concern to the NPS because they sometimes impede the Service's ability to accomplish its mission. Noise impacts from this project will only last the duration of the construction. Most construction would occur during daylight hours when NPS and visitor vehicle use is high. Any additional traffic will only be temporary and will not effect or will negligibly effect the area in the short term. Since, this project would have no measurable effects on the soundscape, this topic will not be analyzed in this document.

Air Quality

Clean Air Act, as amended (42 USC 7401 et seq.) GCNP is designated as a Class I area. Maximum allowable increases (increments) of sulfur dioxide (SO_2), particulate matter, and nitrogen oxides (NO_x) beyond baseline concentrations established for Class I areas cannot be exceeded. Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations. Project construction would result in an increase in a negligible degree of fugitive dust from soil exposure and disturbance. Local air quality may be affected from construction activities and emissions from construction equipment. This would last only as long as construction activities occurred and neither overall park air quality nor regional air quality would be affected. Therefore, this topic will not be analyzed in this document.

Environmental Justice

Neither Alternative would have health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's Draft

Environmental Justice Guidance (July 1996). Therefore, this topic will not be analyzed in this document.

Floodplains and Wetlands

Executive Order 11988 (Floodplains) and Executive Order 11990 (Wetlands), which require federal agencies to examine the potential impacts of actions on floodplains and wetlands, were reviewed for applicability to this project. Because the project is not in or near a floodplain or wetland and would not affect this resource, floodplains and wetlands were dismissed from further analysis.

Prime and Unique Farmland

Prime or unique farmland is defined as soil that particularly produces general crops as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables and nuts. This proposed project location and surrounding lands have been evaluated by appropriate Park technical area specialists and by specialists from the Natural Resources Conservation Service (NRCS). Based on their observations, the project area is not considered prime or unique farmland (Camp, NRCS, pers. comm. 2002). Therefore, this topic was dismissed from further analysis.

Socioeconomic Values

Socioeconomic values consist of local and regional businesses and residents, the local and regional economy, and Park concessions. The local economy and most businesses in the surrounding communities are based on professional services, construction, tourism sales and services, and educational research. The 1995 GMP EIS discussed the socioeconomic environment and impact extensively. There would be negligible short and long-term impacts to the local and regional economy resulting from construction-related expenditures and employment. Therefore, this topic will not be analyzed in this document.

Visitor Experiences

Project construction would not affect visitors as the site of the proposed rehabilitation and construction is not in the visitor use area. Therefore, this topic will not be analyzed in this document.

Chapter 2- Alternatives

INTRODUCTION

This section describes two management alternatives for this project. Alternatives were developed to resolve pertinent housing, maintenance and management issues. A summary table comparing the environmental consequences of each Alternative is presented in this section.

MITIGATION MEASURES

To minimize resource impacts, the mitigation measures below would be followed during implementation of the Action Alternative, and are analyzed as part of the Action Alternative. These actions were developed to lessen the potential for adverse effects of the proposed action, in combination with foreseeable future actions, and have proven to be very effective in reducing environmental impacts on previous projects.

Contractor Orientation

Contractors working in the Park are given orientation concerning proper conduct of operations. This orientation is provided in both written form and verbally at a preconstruction meeting. This policy will continue on proposed projects. Orientation topics will include:

- Wildlife should not be approached or fed.
- Collecting any Park resources, including plants, animals, and historic or prehistoric materials, is prohibited.
- Contractor must have a safety policy in place and follow it.
- A vehicle fuel leakage and spill plan will be developed and implemented for this project.
- Other environmental concerns and requirements discussed elsewhere in this EA would be addressed, including relevant mitigation measures listed below.

Limitation of Area Affected

The following mitigation measures will be implemented to minimize the area affected by construction activities.

- The staging area for the construction office (a trailer), construction equipment, and material storage will be located in previously disturbed areas near the project site. Construction zones will be fenced with construction tape, snow fencing, or some similar material before any construction activity commences. The fencing will define the construction zone and confine activity to the minimum area required for construction. All protection measures will be clearly stated in the construction specifications, and workers will be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.

Soil Erosion

To minimize soil erosion, the following mitigation measures will be incorporated into the Action Alternative.

- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods will be used to minimize any potential soil erosion.
- If soils from outside the Park are required, soils will be cleared for archaeological resources, animal pests, and exotic species and noxious weeds prior to being hauled into the Park.
- Any revegetation efforts will use site-adapted native species and/or native seed, and Park policies regarding revegetation and site restoration will be incorporated into the plan. The plan will consider, among other things, the use of native species, plant salvage potential, exotic vegetation and noxious weeds, and pedestrian barriers.

Policy related to revegetation will be referenced in NPS Management Policies (NPS 2001b; Chapter 9).

Exotic Vegetation and Noxious Weeds

To prevent the introduction and minimize the spread of exotic vegetation and noxious weeds, the following mitigation measures will be incorporated into the Action Alternative.

- All construction equipment that would leave the road (e.g., bulldozers and backhoes) will be pressure washed prior to entering the Park.
- The location of the staging area for construction equipment will be Park-approved and treated for exotic vegetation.
- Parking of vehicles will be limited to existing roads or the staging area.
- Any fill, rock, or additional topsoil required will be obtained from a Park-approved source.
- All areas disturbed by construction will be revegetated using site-adapted native seed and/or plants.

Water Quality

To minimize potential impacts to water quality, the following mitigation measures will be incorporated into the Action Alternative.

- A storm water pollution prevention plan (SWPPP) will be developed by the contractor and approved by the Park prior to any ground-disturbing activities. All National Pollutant Discharge Elimination System (NPDES) requirements will be met.
- Standard erosion control measures such as silt fences, sand bags, or equivalent control methods will be used to minimize any potential sediment delivery to streams.

Special Status Species

To protect any unknown or undiscovered threatened, endangered, or special status species, the construction contract will include provisions for the discovery of such. These provisions will require the cessation of construction activities until Park staff evaluate the project impact on the discovery and will allow modification of the contract for any protection measures determined necessary to protect the discovery. Mitigation measures for known special status species are as follows:

California Condor

- Prior to the start of a construction project, the Park will contact personnel monitoring California condor locations and movement within the Park to determine the locations and status of condors in or near the project area.
- If a condor appears at the construction site, construction will cease until it leaves on its own or until permitted personnel employ techniques that result in the individual condor leaving the area.
- Construction workers and supervisors will be instructed to avoid interaction with condors and to contact the appropriate Park or Peregrine Fund personnel immediately if and when condor(s) appear at a construction site.

- The construction site will be cleaned up throughout and at the end of each day that work is being conducted (i.e., trash disposed of, scrap materials picked up) to minimize the likelihood of condors visiting the site. Park condor staff will complete a site visit to the area to ensure adequate clean-up measures are taken.
- To prevent water contamination and potential poisoning of condors, a vehicle fluid-leakage and spill plan will be developed and implemented for this project. This plan will be reviewed by the Park biologist for adequacy in addressing condors.
- If non-nesting condors appear within 1 mile of the project area, blasting will be postponed until condors leave or are hazed by permitted personnel.
- If condor nesting activity is known within 1 mile of the project area, then blasting activity will be restricted during the active nesting season, if viable nests persist. The active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the Park biologist and the USFWS.
- If condor nesting activity is known within 0.5 mile of the project area, then light and heavy construction in the project area will be restricted during the active nesting season, if viable nests persist. The active nesting season is February 1 to October 15, or until young are fully fledged. These dates may be modified based on the most current information, in consultation with the Park biologist and the USFWS.

Mexican Spotted Owl (MSO)

- If a construction project occurs within a Protected Activity Center (PAC) with no known nest site, then all construction activity will be restricted to the non-breeding season (September 1 – February 28). However, if the project in a PAC is at least 0.8 km (0.5 mile) from known nest sites and the project does not include blasting, then the project can be implemented during the breeding season. The breeding season is March 1 – August 31.
- If a construction project outside of PACs occurs within 1.6 km (1 mile) of a known PAC nest or roost site, the boundary of a PAC where the nest or roost site is not known, or unsurveyed restricted, protected, or predicted MSO habitat, then all blasting in that project area will be restricted to the non-breeding season (September 1 – February 28).
- If a construction project outside of PACs occurs within 0.8 km (0.5 mile) of a known PAC nest or roost site, the boundary of a PAC where the nest or roost site is not known, or unsurveyed restricted, protected, or predicted MSO habitat, then light and heavy construction activity in that project area will be restricted to the non-breeding season (September 1 – February 28).

Cultural Resources

To minimize the impacts of construction activities on cultural resources, the following mitigation measures will be incorporated into the Action Alternative.

- If previously unknown archeological resources are discovered during the course of the project, a Park archeologist will be contacted immediately. All work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed, if necessary, in accordance with the stipulations of the 1995 Programmatic Agreement among the National Park Service, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the General

Management Plan/Environmental Impact Statement, Grand Canyon National Park, Arizona.

- All workers would be informed of the penalties of illegally collecting artifacts or intentionally damaging any archeological or historic property. Workers would also be informed of the correct procedures if previously unknown resources were uncovered during construction activities.

Visual Resources

To minimize visual impacts, mitigation measures will include the following:

- Clearing of trees and understory will be feathered to blend with natural openings in the forest canopy.
- Natural, muted colors will be used to blend any manmade surfaces into the landscape.
- All contractors will use site of proposed new dormitory for primary staging to minimize ground disturbance and to decrease the amount of construction equipment visible to visitors.

Visitor Experience

The following mitigation measure will be incorporated into the Action Alternative to minimize the impacts of construction activities on the visitor experience:

- Unless otherwise approved by the Park, operation of heavy construction equipment will be restricted to 8:00 am to 6:00 p.m. in the summer (May 1- September 30) and to 9:00 am to 5:00 p.m. during the rest of the year.

Park Operations

The following mitigation measure will be incorporated into the Action Alternative to minimize the impacts of construction activities on Park operations:

- The concessioner will provide a contract inspector so Park staff will not need to monitor day to day contract compliance for this project.

Air Quality

Air quality impacts of the Action Alternative is expected to be temporary and localized. To minimize these impacts, the following actions will be taken:

- To reduce entrainment of fine particles from hauling material, sufficient freeboard will be maintained and loose material loads (aggregate, soils, etc.) will be tarped.
- To reduce tailpipe emissions, construction equipment will not be left idling any longer than is necessary for safety and mechanical reasons.
- To reduce construction dust in the short term, water will be applied to problem areas. Equipment will be limited to the fenced project area to minimize soil disturbance and consequent dust generation.

- Landscaping and revegetation will control long-term soil dust production. Mulch and the plants themselves will stabilize the soil and reduce wind speed/shear against the ground surface.

Alternative A – No Action

RV Park

The No Action Alternative would maintain the existing degraded conditions within and adjacent to the RV park and provides the baseline for comparison of the Action Alternative. In this Alternative, the RV park would not be rehabilitated or expanded. The RV park would continue to degrade leading to greater maintenance efforts and costs and limiting critically needed housing to that already existing.

44-Unit Dormitory

The No Action Alternative would maintain the current critical housing shortage on the North Rim and provides the baseline for comparison of the Action Alternative. In this Alternative, the proposed 44-unit dormitory would not be constructed. Housing would remain insufficient to meet the needs of the concessioner to provide services to the park visitor. Employees would continue to be quartered in guest accommodations.

Alternative B - Proposed Action – Construction of 44-Unit Dormitory and Rehabilitation of RV Park

RV Park

Construction proposed in this Alternative would be primarily confined to the footprint of the existing RV park and approximately 2 acres immediately adjacent to it. No trees will be removed. This Alternative consists of:

- Upgrading and rehabilitation of 6 RV parking pads within the existing footprint of the RV park.
- Construction of 4 new RV parking pads within the existing footprint of the RV park.
- Construction of 7 new RV parking pads in a relatively disturbed area immediately adjacent (south) to the RV park.

General Construction Schedule:

Construction would take approximately 4 months, starting on or about October 1, 2003; however, weather conditions or other unexpected events could delay construction.

44-Unit Dormitory

Construction proposed in this Alternative would require further disturbance to approximately 2 acres in the concessioner housing area. Several dormitories already exist in this area in addition to the Employee Dining Room. This Alternative consists of:

- Removal of 6 ponderosa pine trees and 5 dead aspen trees
- Site grading and leveling
- Construction of 8,000 square foot dormitory building
- Construction of 22 regular and 2 handicapped parking spaces
- Follow-up landscaping

General Construction Schedule:

Construction would take approximately 8 months, starting on or about October 1, 2003; however, weather conditions or other unexpected events could delay construction.

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable Alternative is the Alternative that will promote the national environmental policy as expressed in NEPA's Section 101:

- Fulfil the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative B is the environmentally preferable Alternative. This is due to the fact that Alternative B would occur predominantly on previously disturbed lands and would involve negligible impact to cultural and natural resources.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new Alternatives, other than that described and fully

evaluated in this document. The locations described in Alternative B minimize the area of new ground disturbance while still meeting the purpose and need for the action.

Alternative B goes further than Alternative A in addressing the six criteria listed above. The needs of the employees now and in the future would be addressed with the rehabilitation of the RV park and the construction of a new 44-unit dormitory. The new parking pads, building and parking area would be designed to be esthetically and culturally pleasing. Alternative B preserves important historic, cultural, and natural resources in the area by construction of a building that is appropriate for the North Rim and minimizing, to the extent possible, new ground disturbance. Alternative B, more than Alternative A, achieves a balance between the needs of employees and natural and cultural resource protection.

Comparison of Alternatives

Table 1. Summary of Alternative Components

Component	Alternative A – No Action	Alternative B – Preferred
Approximate Building Size (square feet)	0 SF	8,000 SF
New RV pads	0	11
Rehabbed RV pads	0	6
Construction Staging	None	Staging at dormitory site and RV park
Accomplishment of Project Objectives	Does not accomplish project objectives	Accomplishes all project objectives
Approximate Amount of Ground Disturbance (acres) and level of tree removal	0	3-4 acres; 6 live trees removed

Table 2 summarizes the impacts, which are described in detail under each Alternative.

Impact Topic	Alternative A – No Action	Alternative B - Preferred	Cumulative Impacts
Soils and Water	None	Negligible to minor, site-specific, short-term impacts through compaction and displacement of 3-4 acres of soil.	Negligible to minor adverse long-term and short-term effects through soil compaction and displacement, increase in impermeable surfaces, and potential increases in soil erosion.

Impact Topic	Alternative A – No Action	Alternative B - Preferred	Cumulative Impacts
Vegetation: Exotic species	None	3-4 acres disturbed; Minor exotic species introduction potential – reduced with mitigation measures	Adverse, site-specific, long-term minor impact on the vegetative community through modification of 234 acres of vegetation from past development actions and proposed future development actions, or a total of 1.3% of the watershed sub-unit. Minor, adverse, local long-term impacts through previous establishment of exotic vegetation and the potential for spread of exotic vegetation on 18 acres of disturbed ground.
Vegetation: Tree removal	None	6 Ponderosa pine trees would be removed	Future planned projects would result in removal of up to 120-150 primarily ponderosa pine trees greater than 12" dbh. Tree removal would occur in small areas for individual projects in the existing developed area of the North Rim.
General Wildlife Populations	Populations generally remain the same; no effect to listed species or species of concern	Negligible to minor short-term impacts to general wildlife populations	Minor to moderate adverse, local, short- and long-term impacts through direct disturbance during construction and indirect disturbance through habitat fragmentation as a result of past, present and future actions, minimized by concentration of development on the Bright Angel peninsula.
Special Status Species: Mexican Spotted Owl (MSO)	No change	No direct disturbance of MSO habitat; Section 7 determination for remainder of project would be: may affect, but is not likely to adversely effect (MANLAA) due to potential impacts of construction noise.	Modification of potential foraging habitat, slight modification of potential nesting habitat for some future projects. Daily human activity on the Bright Angel peninsula would constitute a negligible to minor adverse, long-term, local effect to MSOs.
California Condor	No change	Negligible to minor short-term adverse impacts through increased likelihood of contact between condors and humans during construction. Section 7 determination would be MANLAA.	Minor local, long- and short-term adverse impacts through increased likelihood of contact between condors and humans.

Impact Topic	Alternative A – No Action	Alternative B - Preferred	Cumulative Impacts
Peregrine Falcon	No change	Negligible long-term adverse impacts through minor modification of potential foraging habitat	Negligible adverse local long-term adverse impacts through modification of potential foraging habitat
Northern Goshawk	No change	Negligible adverse impacts through due to short-term construction noise and slight modification of potential foraging habitat.	Minor adverse long- and short-term local effects through daily disturbance in developed areas during the breeding season and modification of potential nesting and foraging habitat
Kaibab Squirrel	No change	Negligible adverse impacts due to short-term construction noise; no loss of potential nesting, foraging or sheltering sites.	Minor to moderate long-term local adverse impacts through loss or modification of potential nesting, foraging and sheltering sites in ponderosa pine habitat in the developed areas of the North Rim; moderate short-term adverse impacts during construction.
Park Operations	No change; minor to moderate adverse impacts would continue due to continued maintenance needs for degraded RV parking pads and lack of staff to provide services to park visitors.	Minor to moderate long-term beneficial impacts through decreased maintenance requirements and increased housing for employees.	Long-term, local, moderate beneficial impacts on Park/concessioner operations through upgrades to facilities and provision of additional housing.

Chapter 3 - AFFECTED ENVIRONMENT

GCNP encompasses 1.2 million acres in northern Arizona. The proposed project is located at the North Rim of Grand Canyon National Park within the Bright Angel watershed. The North Rim drains predominately south into the Grand Canyon. Although it appears relatively flat, numerous drainages and canyons cut the North Rim. Climatic conditions in the Grand Canyon region are diverse and elevation-based. Most of the precipitation comes from summer thunderstorms and winter rain and snow. The project area is on the Bright Angel Peninsula, a narrow portion of the Kaibab Plateau on which most of the development on the North Rim is located. The project area is on relatively flat terrain at approximately 8,300 feet in elevation.

The concessioner housing area on the North Rim is made up of 4 dormitory buildings, 6 small cabins, and a RV park with 16 parking pads. In the immediate vicinity are an Employee Dining Room (EDR), concessioner maintenance/storage building, and a NPS maintenance building. The concessioner housing area, including the RV park covers approximately 5 acres. It is located approximately ½ mile south of the North Rim Administrative Area and ½ mile north of the

historic Lodge. The site is not within a historic district and is neither visible nor accessible to the public, being west of the main North Rim road (State Highway 67) and well screened by heavy vegetation and topography. The vegetation surrounding the housing area is Ponderosa Pine and mixed conifer. Located on a peninsula of rocky land, the topography of the concessioner housing area is comprised of a fairly flat upland sloping steeply to the east and west. The area is moderately disturbed following many years of pedestrian and vehicle traffic.

NATURAL RESOURCES

Soils and Water

The developed areas of the North Rim, including the project location, are underlain by Kaibab limestone, a very porous rock layer. This and other porous sedimentary layers of Grand Canyon create a subdued karst topography in which numerous solution channels and sinks have formed. Little or no surface water is present because water penetrates through the soil and rock layers quickly. Soils tend to be shallow and poorly developed, but stable, with frequent rock outcroppings. Soil horizons and structure are well developed and are well drained. Productivity of most soils in the Park is low, so that revegetation is slow and usually requires considerable maintenance. However, North Rim soils are generally deeper and retain more moisture than South Rim soils so that revegetation efforts are generally more successful here (GMP 1995). Warren (1982) describes soils in the vegetation type characteristic of the project area as moderately deep with loamy texture, derived from Kaibab limestone. Natural Resources Conservation Service (NRCS) has conducted a soil survey of the Grand Canyon over the last several years. The study has documented that soils in the developed area of the North Rim are generally rocky and cobbly, with varying amounts of clay. Bedrock is typically 30-60 inches below the soil surface (NRCS 2001). Soils in the project area are in satisfactory condition (indicating the soil has retained its inherent productivity). This is due to the presence of needlecast and downed woody material that protects the soil from erosion by preventing raindrops from directly impact soil particles (Kohnke and Franzmeier 1995) and the overall lack of any previous significant ground disturbance such as wildlife or domestic livestock grazing pressure. Due to the soil types in the area, building foundations should be built on bedrock 30-60 inches below the soil surface (Lindsay, pers. comm.)

The project area is located within the Bright Angel Creek watershed. There is no standing water or any major or minor drainages in the project vicinity. There is no riparian habitat present within or adjacent to the project area. Although the North Rim has a few sinkhole ponds, wet meadows and small springs, there is very little surface water on the plateaus of Grand Canyon National Park, and there is no surface water within the developed portion of the North Rim. Most water movement in this area is subsurface flow.

Vegetation

There are thirty (30) known exotic plant species documented on the North Rim area of GCNP. See appendix B for the list of Documented Exotic Plant Species and Potential Invasive Exotic Plant Species (Makarick, 2001).

The major vegetation type on the North Rim is Rocky Mountain montane conifer woodland. Four montane coniferous forest communities are distributed in broad elevation bands across the north rim. At the highest elevations above 8,800 feet is a mixed conifer forest dominated by Engelman spruce (*Picea engelmannii*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*). Below this, from about 8,400 feet is a community

dominated by ponderosa pine and Douglas fir. Below this, from about 8,000 feet is a community dominated by ponderosa pine and white fir. The last community forms a broad belt from about 8,000 feet to the plateau rim at 7,600 feet with ponderosa pine as a single dominant.

The one abundant deciduous tree on the North Rim is quaking aspen (*Populus tremuloides*), and it is common throughout all of these forest communities (Warren et. al 1982). Understory deciduous shrubs common to all forest types include Gambel's oak (*Quercus gambelii*), New Mexico locust (*Robinia neomexicana*) and Utah serviceberry (*Amelanchier utahensis*).

The specific project area falls within the Ponderosa Pine – New Mexican locust – Gambel's Oak Series. The physiognomy of this type includes open park-like stands, deciduous shrubs patchily distributed in clumps in the understory, and variable herbaceous ground cover. Quaking aspen also occurs within this type, typically in drainages at the higher elevations (Warren et al. 1982). Generally speaking, the administration building is set in ponderosa pine habitat (Figure 4).

There are 19 exotic plant species of primary concern on the North Rim (Appendix B). Exotic species of highest concern on the North Rim include red top grass (*Agrostis stolonifera*), smooth brome (*Bromus inemis*), oxeye daisy (*chrysanthemum leucanthrum*), houndstongue (*Cynoglossum officinale*), orchard grass (*Dactylis glomerata*), Dalmatian toadflax *(Linaria dalmatica*), horehound (*Marribium vulgare*) and Johnson grass (*Sorghum halepense*). These will be the focus of surveys and mitigation measures to minimize the potential for introduction or spread in the project area.

Wildlife

General Wildlife: Mammals typically associated with montane conifer forests on the North Rim include porcupine, mule deer, 19 species of bats, montane voles, chipmunks, and Kaibab squirrels. Birds include red-faced warbler, pine siskin, yellow-rumped warbler, pygmy nuthatch, western bluebird, blue grouse, Merriam's turkey, and several species of hawks (red-tailed hawk, Cooper's hawk, sharp-shinned hawk, and northern goshawk). Amphibians and reptiles include tiger salamander, northern leopard frog, western rattlesnake, ringneck snake, and western skink (Brown 1994). Those species that are not considered special status species, but for which there is interest in and concern for their populations on the North Rim, are listed in the following table and discussed briefly below. This list was developed based on input from biologists from the Park, AGFD, and USFWS.

Table 3. Species of Interest on the North Rim.

Common Name	Scientific Name
Mule deer	*Odocoileus hemionus*
Blue grouse	*Dendragapus obscurus*
Desert bighorn sheep	*Ovis canadensis*
Mountain lion	*Felis concolor*
Voles and shrews	*Microtus* spp. and *Sorex s*pp.
Ferruginous hawk	*Buteo regalis*
Flammulated owl	*Otis flammeolus*
Breeding birds	Various species

Breeding Birds. The Arizona Working Group of Partners in Flight developed a Bird Conservation Plan (Latta et al. 1999) as part of a national effort to address the concern for the future of migratory and resident birds. The Conservation Plan lists priority bird species by habitat type and

identifies management actions that will benefit those species. The project areas are in ponderosa pine and the Conservation Plan identifies four priority species in this habitat type: northern goshawk, olive-sided flycatcher, cordilleran flycatcher, and purple martin. Combined, these priority species, as well as species associated with them, use the entire range of structural levels represented in ponderosa pine from grasses to the top of the canopy. The goshawk is also considered a special status species and will be discussed below. Management recommendations for habitat for the olive-sided flycatcher include maintaining or creating tall snags for perches and applying pre-settlement restoration treatments. Recommendations for the cordilleran flycatcher include maintaining dense canopy closure in mid- to late-successional stages with an oak understory and dead and down trees for nesting. Recommendations for purple martin include creating snags and promoting the longevity of large snags, use prescribed fire and mechanical thinning to reduce tree densities and manage for openings in the forest canopy. Arizona Partners in Flight recommends using fire as a management tool to create desired forest conditions and reduce fuel load as an efficient method for all four bird species. Recommendations for forest management that would benefit breeding birds came out of a study by Rosenstock (1996) that included a study site in Grand Canyon National Park. Recommendations pertinent to this project include retention of snags, Gambel's oak, and large old ponderosa pine, particularly those equal to or greater than 24 inches diameter at breast height (dbh.)

The dormitory and RV park upgrade project would occur in habitat suitable for mule deer, voles and shrews, and breeding birds. Because the project area is relatively small, mule deer would not rely solely on the project area for their habitat requirements. Ferruginous hawks would likely be found closer to meadows outside of the developed zone. Flammulated owls and blue grouse are known to be found in denser mixed conifer forest on the North Rim, but generally outside of the Bright Angel peninsula. Mountain lions and bighorn sheep may travel through the project area, but it does not provide key habitat for these species because it is within the developed area of the North Rim on the Bright Angel peninsula, and existing use by visitors and employees in this area is moderate to high during peak season.

Special Status Species: Table 4 includes a list of threatened, endangered, proposed, and species of concern on the North Rim of Grand Canyon National Park, based on known occurrences or habitat preferences. In-depth discussion of federally listed species issues in the analysis area is the subject of a separate Biological Assessment (BA). Of the 10 federally listed wildlife and plant species that are known to occur or are likely to occur in Grand Canyon National Park, three occur on or near the North Rim. There are no confirmed nest or roost locations for special status species in the project area.

The list in Table 4 was developed from personal knowledge of the area by Park biologists, park records, the AGFD Heritage Nongame Data Management System database (2000), and Arizona Game and Fish Department and U.S. Fish and Wildlife Service biologists.

A detailed analysis of the expected effects of this project on Threatened and Endangered species is the subject of a separate Biological Assessment (NPS 2002).

Table 4. **Special Status Species of the North Rim, Based on Known Occurrences or Habitat Preferences.**

Species	Scientific Name	Status	Project Vicinity Occurrence
Mexican Spotted Owl	*Strix occidentalis lucida*	T, WC	Nearest known protected activity center is greater than 0.5 miles from project area; project area not considered MSO critical

			habitat.
California Condor	*Gymnogyps californicus*	T*, WC	No nest sites known in vicinity, but condors observed regularly on North Rim.
American Peregrine Falcon	*Falco peregrinus anatum*	WC, SC	Nearest known eyrie is approximately 2 miles south of project area; foraging potential in developed areas is low
Northern Goshawk	*Accipiter gentiles*	WC, SC	Nearest goshawk territory boundary is approximately 1 mile northwest of project area; nesting and foraging habitat potential in project vicinity
Kaibab Squirrel	*Sciurus aberti kaibabensis*	NNL	Yes; known to occur throughout North Rim developed areas; project area within NNL designated habitat
Greater Western Mastiff Bat	*Eumops perotis californicus*	WC, SC	No known roosts nearby; foraging and roosting potential unlikely in North Rim developed areas
Spotted Bat	*Euderma maculatum*	SC	No known roosts nearby; foraging and roosting potential unlikely in North Rim developed areas
Northern Leopard Frog	*Rana pipiens*	WC	No known locations nearby, but North Rim is within range for the species

Key:

T = federally listed as threatened under the Endangered Species Act (ESA); WC = Wildlife species of special concern in Arizona (AZ Game and Fish Department 10/14/96); SC = former species of concern to the US Fish and Wildlife Service, but for which there is no legal status (all former C2 species Fed Reg. 2/28/96); T = federally listed as an experimental non-essential population in Arizona, but in National Parks the species is considered federally listed as threatened under ESA; NNL = population on Kaibab plateau is considered a National Natural Landmark with direction to federal agencies to consider the unique properties of Natural Landmarks when assessing effects of actions on environment; PAC = Mexican spotted owl protected activity center.*

The greater western mastiff bat and spotted bat are known to occur on the North Rim. Both species roost in cliffs and are insectivorous. Recent studies in northern Arizona are focusing on greater western mastiff bats and have been documenting roosts and foraging areas in the Grand Canyon. There are, however, no documented roost sites or key foraging areas within the general vicinity of project locations, although foraging is likely to occur in the open meadows north of the developed zone. An increasing number of studies are focusing on spotted bats and are slowly improving our understanding on this species (including recent surveys on neighboring Kaibab National Forest), although population abundance and densities are still poorly known. Spotted bats have recently been documented roosting in cliff faces in Grand Canyon, and have been documented foraging on the north and south rims of the park. Spotted bats forage in meadows. There are no documented roosting or foraging sites within the general vicinity of the proposed project locations, although foraging is likely to occur in the open meadows north of the developed zone. The proposed project and past, present, or foreseeable future actions would not affect roosting or foraging habitat or prey populations for these species. Therefore, these species were not considered further in this document.

The Northern leopard frog has not been documented in the North Rim developed area on Bright Angel peninsula. However, old records indicate that the species may occur on the North Rim. Surveys are currently underway to determine presence and distribution within the park. Because there are no known occurrences in or near the project area and because the project area does not contain potential habitat for this species, Northern leopard frog was not considered further in this document.

PARK/CONCESSIONER OPERATIONS

Park operations refer to the adequacy of staffing levels and the quality and effectiveness of the Park infrastructure in protecting and preserving vital resources and providing for an effective visitor experience. Infrastructure facilities include the roads that are used to provide access to and within the Park (both administrative and visitor use), housing for staff required to work and live in the Park, visitor orientation facilities (visitor centers, developed and interpreted sites, and other interpretive features), administrative buildings (office and workspace for Park staff), management support facilities (garages, shops, storage buildings, and yards used to house and store maintenance equipment, tools, and materials), and utilities such as phones, sewer, water, and electric.

As described previously in this document, the concessions housing area is located between the Lodge and Administrative Use areas on the North Rim. The concessioner is completely responsible for operations and maintenance of the housing and grounds in the concessioner housing area. The Park provides power and water to the area.

Chapter 4 - ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The National Environmental Policy Act (NEPA) requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided should the proposed action be implemented. Because the analysis of impacts and effects will be the same for both the dormitory and the adjacent RV park upgrades, it has been decided to collectively address impact analysis and effects of actions and not to analyze them separately.

Methodology

The impact analysis and conclusions contained in this chapter were based on Park staff knowledge of the resources and site; review of existing literature and Park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area.

Potential impacts in this chapter are described in terms of type (are the effects beneficial or adverse?), context (are the effects site-specific, local, or even regional?), duration (are the effects short-term or long-term?), and intensity (negligible, minor, moderate, or major). Because definitions of intensity can vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

For purposes of impact analysis in this Chapter, the following definitions of duration are used to characterize impacts discussed.

- Short-term – temporary effects typically confined to the construction period.
- Long-term – more permanent effects that will remain following construction.

Cumulative Impacts

A cumulative impact is described in regulations developed by the Council on Environmental Quality (CEQ), 40 CFR 1508.7. A "cumulative impact" is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal), or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over a period of time. Therefore, it is necessary to identify other ongoing or foreseeable future actions within the vicinity of the North Rim. For this analysis, foreseeable future actions were considered to be actions that could occur in the vicinity of the North Rim within the next five years that currently have funding or funding is actively being sought. Five years was selected as the time frame for foreseeable future actions because most of the direct and indirect impacts of the proposal would occur within five years.

The area of cumulative impact was chosen to be the Bright Angel watershed sub-unit. This sub-unit is approximately 19,415 acres in size and includes the 340-acre Bright Angel peninsula and much of Highway 67 to the North Rim entrance station. The area of impact was chosen to be the Bright Angel watershed sub-unit. This is because of the potential for impacts of multiple actions on the natural environment within one watershed. Past and present activities that have affected the Bright Angel peninsula and the surrounding area include past prescribed burns and wildfires and existing development and visitation at the North Rim. Existing developments (roads, trails, parking areas, buildings, and utilities) have affected approximately 234 acres within the Bright Angel watershed sub-unit.

Twenty-one improvement projects, in addition to the proposed action, are planned within the Bright Angel Peninsula sub-watershed and would result in disturbance to approximately 18 acres of ground. Most of this area has been previously disturbed. Approximately 120 - 150 trees greater than 12 inches in diameter at breast height (dbh) would be removed for these projects. These projects are summarized in Appendix C and displayed Appendix A. Over the next five years, prescribed fire is planned for 1,000 acres in 2004, and 500 acres in 2006 within the Bright Angel Peninsula sub-unit.

Cumulative impacts are expected to be similar for either alternative selected because of the small amount of disturbance relative to the watershed as a whole. If the No Action Alternative was selected, and all other future projects were implemented, the impacts to the natural environment would still be similar to those that would occur if the Action Alternative for this project was selected. The difference between the alternatives is also not measurable, when combined with other future actions on a watershed level. Therefore, the analysis applies to either alternative selected.

A cumulative impact analysis was conducted for the full implementation of the GMP and is documented in the EIS. The general finding in the EIS for cumulative effects to natural resources was a net reduction in natural habitat within the Park and the region, but a net reduction less than that for two other alternatives analyzed. Cumulative effects to archeological resources could

occur, specifically to traditional cultural properties, but a planned ethnographic survey program would minimize this likelihood. Cumulative effects were not expected to historic structures under the assumption that existing cultural resources within the Park would be protected and preserved and some historic buildings would be rehabilitated and restored. Cumulative effects to visitor experience in the Park under implementation of the GMP were expected to be positive overall as the result of additional food service and accommodations, and contributions to regional and national efforts to expand informational resources, expand interpretive and educational opportunities, and disperse tourism in the area. Because the GMP was a general concept plan, and because it required that site-specific analyses be conducted for projects identified in the GMP, a cumulative effects analysis that is more specific to impact topics pertaining to the North Rim campground rehabilitation and water distribution system improvements is needed. Cumulative impacts are described in this Chapter for each impact topic.

Impairment

In addition to determining the environmental consequences of implementing the Alternative, National Park Service policy (*Management Policies 2001*) requires analysis of potential effects to determine whether actions would impair Park resources.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from National Park Service activities in managing the Park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the Park. The potential for impairment is discussed for each applicable resource for each Alternative in this chapter. A statement summarizing the conclusions of this evaluation is included in the conclusion statement at the end of the environmental consequences section for each applicable resource in this chapter.

NATURAL RESOURCES

Soil and Water

Methodology

The baseline information used to assess impacts to soil and water resources is as described in the methodology section at the beginning of this chapter and includes Park staff knowledge of the resources and site; review of existing literature and Park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area. Additional sources of information on soil and water resources used as a basis for this evaluation are as described in the affected environment section.

The thresholds of change for the intensity of an impact on soil and water resources are defined as follows:

Negligible – a change to soil or water resources that is not measurable or perceptible.

Minor – a measurable or perceptible, small, localized change to soil or water resources. The change is of little consequence.

Moderate – a change to soil or water resources that is measurable and of consequence but is localized.

Major – a measurable change to soil or water resources that is large and/or widespread and could have permanent consequences for the resource.

Alternative A – NO ACTION

Direct/Indirect Effects. Approximately 234 acres of soil have been disturbed for existing developments in the 19,415-acre Bright Angel watershed sub-unit. Construction activities can result in reduced water infiltration, reduced soil porosity, reduced water holding capacity, reduced aeration of the soil, increased surface runoff, and increased soil erosion (except in those areas that are covered by impervious surfaces) through the compaction and displacement of soil. Because of the high porosity of the soils, low rainfall, and lack of steep slopes at the North Rim, these effects have been minor. The impacts to soil and water resources have been adverse, minor, local, and long-term. No construction activities are proposed under Alternative A, and this Alternative would result in no additional effects to soil and water resources.

Alternative B – 44-Unit Dormitory and RV Park Upgrade – Proposed Action

Direct/Indirect Effects. Approximately 4 acres would be disturbed under the proposed Action. The majority of this new ground disturbance would be covered with buildings, pavement, or other impervious surfaces and would not be susceptible to future erosion. The majority of water would continue to be lost through percolation, and surface runoff from the North Rim would remain associated with severe storm events. Due to this low level of ground disturbance, the quality of ground and surface water would not be measurably affected by the proposed developments.

Any increases in sedimentation during construction would be minimal because of the lack of surface water runoff and implementation of standard soil erosion control measures. In addition, the potential impacts of increased sedimentation would be limited to the period of construction and vegetation recovery. Mitigation measures that have been included for the Action Alternative are designed to minimize soil disturbance and increased runoff during construction. Therefore, direct and indirect effects to the soil and water resources under Alternative B would be negligible, local, adverse, and both long- and short-term.

Cumulative Impacts. Past and present development has resulted in soil compaction and displacement on approximately 234 acres within the Bright Angel watershed sub-unit, and foreseeable future development would affect approximately 18 acres of soil (18 acres for foreseeable future projects and 4 acres for preferred Alternative). Future actions are described briefly in Appendix C and displayed in Appendix A. All of these future projects would occur within the developed area of the North Rim and would be in, or in close proximity to, previously disturbed and developed areas. A developed zone for the North Rim has been identified in the 1995 GMP and is used to guide management actions. This developed zone, which primarily includes Bright Angel peninsula, but also encompasses the North Rim Entrance Road and roads out to the Walhalla Plateau, comprises approximately 1,127 acres within the Bright Angel watershed sub-unit, or approximately 6% of the sub-unit. Approximately 234 acres of this, or 21%, is disturbed by past activities and developments. Existing developments include roads, trails, parking areas, buildings, and utilities. Mitigation measures would be implemented for these future actions and would minimize effects on soil erosion and surface water. Any increases in soil erosion would be limited to the period of construction and vegetation recovery.

Impairment. Adverse impacts under the preferred Alternative would be negligible to minor. Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or (3) identified as a goal in the Park's general management plan or other relevant NPS planning documents, there would be no impairment of the Park's resources or values.

Conclusion. The No Action Alternative would result in the least impact to soil and water resources. Impacts to soil and water resources would be negligible for Alternative B. Cumulative impacts, regardless of the Alternative selected for this project, would be negligible to minor, and the preferred Alternative would not result in impairment of soil or water resources. Mitigation measures that have been included for the Action Alternative are designed to keep erosion and sedimentation within acceptable limits by minimizing soil disturbance and increased runoff during construction. Toxic materials will not be introduced into the soils or watershed during construction activities, and permit clauses would address spillage situations. The lack of steep slopes, perennial water, or drainages in the project area also substantially reduces the risk of negative impacts to soils and water off the project site.

Exotic Vegetation and Noxious Weeds

Methodology

The baseline information used to assess impacts to vegetation is as described in the methodology section and includes Park staff knowledge of the resources and site; review of existing literature and Park studies; information provided by specialists within the National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in

Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area. Additional sources of information on vegetation used as a basis for this evaluation are as described above in the affected environment section.

The thresholds of change for the intensity of an impact to vegetation are defined as follows:

Negligible – a change to a biotic community that is not measurable or perceptible.

Minor – a measurable or perceptible, small, localized change to a biotic community. The change is of little consequence.

Moderate – a change to a biotic community that is measurable and of consequence but is localized.

Major – a measurable change to a biotic community. The change is large and/or widespread and could have permanent consequences for the species or resource.

Alternative A – NO ACTION

Direct/Indirect Effects. Approximately 234 acres of montane conifer forest have been modified with existing developments in the 19,415-acre Bright Angel watershed sub-unit. This impact to vegetation is considered adverse, but site-specific and confined to existing developed areas, and so constitutes a long-term, but minor effect to vegetation in this area. No vegetation manipulation or construction activities are proposed under Alternative A, and this Alternative would result in no additional effects to the biotic community. The No Action Alternative would maintain the existing vegetation community in its current condition and would not require any tree removal.

The construction of existing roads and buildings in the Bright Angel watershed sub-unit has resulted in the presence of exotic vegetation in these areas. Approximately 234 acres of ground have been disturbed for the construction of existing visitor services, housing, roads, and utilities. Ongoing exotic vegetation control programs, which include hand pulling, mechanical treatments, and a small amount of herbicide control, would continue under the No Action Alternative. Because the size of the current program is limited, existing populations of exotic vegetation would continue to spread and slowly replace native vegetation. This would most likely occur along roads and utility corridors. These impacts would be minor, adverse, local, and long-term. This Alternative would not implement any new ground-disturbing activities and thus would have no additional effects on exotic vegetation or noxious weeds.

Alternative B – 44-Unit Dormitory and RV Park Upgrade – Proposed Action

Direct/Indirect Effects. Alternative B would require removal of 6 live pine trees. Ground disturbance is necessary for the preferred Alternative and some herbaceous grasses and shrubs would be disturbed in some areas. Loss of vegetation for construction of the new dormitory and RV park upgrades would likely have negligible, adverse, local, short-term and long-term effects on vegetation communities. There is a possibility that construction activities could damage tree root systems in the area. Root damage can sometimes result in tree mortality within a 5-10 year period. This would create the potential for hazard trees adjacent to the project area over time, and the need for them to be removed in the future.

An increase in the amount of disturbed ground would increase the potential for the spread or introduction of exotic vegetation. However, most of the new ground disturbance would not be subject to potential exotic vegetation invasion because it would be covered by impervious surfaces. In addition, mitigation measures such as pressure washing of ground-disturbing equipment would substantially reduce the risk of introducing a new exotic species. Post-construction revegetation, monitoring, and treatment, when feasible, would also reduce the risk of spreading existing populations and introducing new species. Overall impacts of either Action Alternative on the spread and introduction of exotic vegetation would be adverse, negligible, local, and long-term.

Cumulative Impacts: In addition to the approximately 234 acres of habitat that have been impacted by existing development, modification of an additional 18 acres would occur as the result of foreseeable future development and construction-related projects in the North Rim developed area. All of these future projects would occur within the developed area of the North Rim and would be in, or in close proximity to, previously disturbed and developed areas. Approximately 120 - 150 (greater than 12 inches dbh) ponderosa pine trees may need to be removed as a result of implementation of foreseeable future projects. This adverse impact on the vegetative community would be site-specific, long-term, and minor when future projects are implemented in combination with impacts already existing from past actions. Cumulative impacts would include decreased wildlife security, disturbance to adjacent habitat, and fragmentation in the North Rim. However, this disturbance of vegetation and wildlife habitat through planned projects and associated tree removal would occur within the existing developed area of the North Rim where visitation levels are high in peak season. These local, short- and long-term, adverse impacts would be minor because of the widespread availability of montane conifer habitat within the Bright Angel watershed sub-unit and the concentration of the disturbance in a relatively small area of the peninsula, which comprises a small percentage of the watershed as a whole.

Impairment. Adverse impacts to the biotic community under the preferred Alternative would be negligible to minor. Because there would be no major, adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the Park or to opportunities for enjoyment of the Park; or (3) identified as a goal in the Park's general management plan or other relevant NPS planning documents, there would be no impairment of the Park's resources or values.

Conclusion. The No Action Alternative would result in the least impact to vegetation. Alternative B would result in approximately 4 acres of ground disturbance and removal of 6 live pine trees. Alternative B would result in negligible long- and short-term, local, adverse impacts to vegetation. Cumulative impacts would also be adverse, but would still be minor due to the extent of undisturbed montane conifer forest in the Bright Angel watershed sub-unit, and the small percentage the developed portion of the North Rim comprises of the available forested area within the watershed sub-unit.

Wildlife and Special Status Species

Methodology

The baseline information used to assess impacts to wildlife and special status species is as described in the methodology section and includes Park staff knowledge of the resources and site; review of existing literature and Park studies; information provided by specialists within the

National Park Service and other agencies; and professional judgement. Detailed information on natural and cultural resources in Grand Canyon National Park that is summarized in the 1995 GMP and associated Environmental Impact Statement (EIS) was specifically referenced for information on affected resources in the project area. Additional sources of information on wildlife used as a basis for this evaluation are as described above in the affected environment section.

The thresholds of change for the intensity of an impact on wildlife populations are defined as follows:

Negligible – no impacts to general wildlife populations or listed special status species or impacts that are only temporary in effect are expected. These temporary effects would be short term, localized, and not perceptible. For purposes of section 7 under the Endangered Species Act, the determination of effect would be *no effect* to listed species or their habitat.

Minor – a measurable but small, localized change to a population or individuals of a species or to designated critical habitat. The change is of little consequence, but is not discountable. For purposes of section 7 under the Endangered Species Act, the determination of effect would be *may affect, but is not likely to adversely affect* to listed species or their habitat.

Moderate – a change to a population or individuals of a species or to a designated critical habitat. The change is measurable and of consequence, but localized. The change is not expected to threaten the continued existence of the listed species within the park. For purposes of section 7 under the Endangered Species Act, the determination of effect would either be *may affect, but is not likely to adversely affect* listed species or their habitat or *may affect, likely to adversely affect listed species* or their habitat.

Major – a measurable and large and/or widespread change to a population or individuals of a species or to designated critical habitat. The change could threaten the continued existence of the species in the park. For purposes of section 7 under the Endangered Species Act, the determination of effect would be may affect, *likely to adversely affect* listed species or their habitat.

Alternative A – NO ACTION

Direct/Indirect Impacts. The No Action Alternative would maintain the project area in its current state and would continue to provide habitat in the project area for many wildlife species, although habitat quality in the immediate area would remain relatively low due to the existing level of development and human activity. Without a change in vegetation or human use in the project area, wildlife populations would generally remain the same. Selection of the No Action Alternative would not affect threatened and endangered species (TES) in the project vicinity, or their habitat, beyond the on-going impacts of visitation and human activity that have been occurring in this area for many years. The continued use of the concessions housing area would not impact any sensitive wildlife habitat requirements such as nesting and/or roosting sites, key foraging areas, key calving or fawning areas, or primary wildlife travel corridors. Selection of the No Action Alternative would therefore have no impact on species of interest or species of concern.

Mexican Spotted Owl: Ongoing activities at the North Rim create daily disturbance from mid-May to mid-October. This disturbance has decreased the quality of habitat in and around the North Rim developed area for MSO and would continue under the No Action

Alternative. Fewer people visit the North Rim during the remainder of the year, when Park facilities are closed and snow often obstructs the road. These local, adverse, long-term impacts are negligible because no roosting or nesting habitat is present on the North Rim and the amount of foraging habitat affected is negligible compared to the amount of available habitat. No vegetation manipulation or construction activities are proposed under Alternative A, and no new sources of disturbance would be introduced. Alternative A would therefore have no additional effects on MSO.

California Condor: Existing developments at the North Rim create year-round human presence in the vicinity. Human presence creates the possibility for condor/human interactions. Condors are monitored daily via radio telemetry, and any condors that land in the developed area at the North Rim would be hazed by permitted Park employees to ensure condors do not become habituated to humans. Current Park policies and activities would be continued under Alternative A, and adverse impacts to condors would be negligible, long-term, and local. No vegetation manipulation or construction activities are proposed under Alternative A. No California condor habitat would be impacted, and no new sources of disturbance would be introduced with this Alternative. Therefore, the No Action Alternative would have no additional effects on California condors.

Northern Goshawk: Existing developments on and near the Bright Angel Peninsula have resulted in the removal or modification of potential nesting and foraging habitat for the northern goshawk. Human activity at the North Rim, particularly on the Bright Angel Peninsula from mid-May to mid-October, also reduces the suitability of the area for nesting and foraging by goshawks. Existing development and human activity could have adverse, local, long-term, minor impacts on northern goshawks. No additional habitat would be modified under the No Action Alternative, and this Alternative would not have any additional effects on northern goshawks.

Peregrine Falcon: The construction of existing developments on and near the Bright Angel Peninsula has affected potential habitat for peregrine prey. This local, adverse, long-term impact is negligible because the amount of habitat affected is negligible compared the amount of available habitat. Noise from year-round activities at the North Rim is unlikely to affect peregrines because no eyries are known from within 0.5 mile of the developments. Therefore, impacts of the continuation of current Park policies on peregrine falcons would be adverse, negligible, local, and long-term. No construction would take place under Alternative A, and this Alternative would have no additional effects on peregrine falcons.

Kaibab Squirrel: Existing developments on the Bright Angel Peninsula have resulted in the removal or modification of approximately 93 acres of ponderosa pine habitat. Although ponderosa pine habitat is widespread on the North Rim and the Kaibab Plateau, the developed area on the Bright Angel Peninsula contains the only ponderosa pine habitat in the Bright Angel Peninsula subwatershed. This loss of habitat thus constitutes a minor to moderate, local, adverse, long-term effect to Kaibab squirrels and the National Natural Landmark. No additional habitat would be modified under the No Action Alternative, and this alternative would not have any additional effects on Kaibab squirrels.

Direct/Indirect Impacts: Loss of habitat for proposed activities would likely have negligible, adverse, local, short- and long-term effects on wildlife populations. A direct loss of some individuals could occur during construction activities. However, the majority of small mammals, birds, and reptiles that are currently utilizing the habitat that is proposed for disturbance would be displaced to adjacent habitat. Vegetation disturbance could result in a loss of foraging habitat and cover for deer, turkey, voles/shrews, and breeding birds, but this likelihood is considered remote due to the small size of the disturbed areas and the fact that the work would be conducted in the existing developed area of the North Rim. Therefore, the Action Alternative may impact individual Species of Interest, but, because of the small size of the project area and the implementation of mitigation measures, are not likely to result in a trend toward federal listing or loss of population viability for these species.

In addition to loss of habitat, impacts of implementing the Action Alternative would include decreased wildlife security, increased disturbance to adjacent habitat, and increased fragmentation. However, these adverse, long-term, local impacts would be negligible because they would occur in areas currently degraded because of high disturbance levels from existing developments, roads, utility corridors, and human use.

Mexican Spotted Owl: No vegetation manipulation would occur below the rim and no activities related to increasing visitor use of the area below the rim are proposed. Therefore, the Action Alternative would not result in any impacts to nesting or roosting habitat. Foraging habitat that would be affected is of marginal quality because of high disturbance levels from existing developments, roads, and human use. In addition, relative to the amount of available foraging habitat, the amount lost would be negligible. The loss of foraging habitat could result in a limited amount of prey base mortality. Woodrats, mice, and voles could be killed during construction activities. However, the majority of prey utilizing the habitat proposed for removal would be displaced to adjacent habitat and not killed. In addition, the change in prey base would be negligible because only a small area would be affected relative to available habitat for prey species. Spotted owls are unlikely to be affected by noise associated with construction activities because the nearest known PAC is more than 0.5 mile from the most of the project areas. Therefore, the Action Alternative would have a negligible, local, long-term, adverse impact to MSO.

California Condor: The Action Alternative would not result in any impacts to nesting or roosting habitat for the California condor because all such habitat occurs below the rim. No vegetation manipulation would occur below the rim, and no activities related to increasing visitor use of the area below the rim are proposed. Foraging habitat would not be affected because this Alternative would not change the availability of food sources for condors. The Action Alternative could affect California condors through increased contact with humans during construction. Condors may be attracted by construction activities, and condor contact with humans would be of concern if the birds are harassed or become habituated to humans. Mitigation measures to cease construction activities if condors are present would reduce disturbance from construction activities on the birds. Hazing by permitted Park employees would ensure condors do not become habituated to humans. Because activities proposed under the Action Alternative would occur in areas of the North Rim that are already developed, use of the facilities should not have any long-term effects on the potential for interactions between condors and humans. Therefore, adverse impacts to condors would be short-term, local, and negligible.

Northern Goshawk*:* Habitat modification would result from the Action Alternative, but the habitat that would be modified is of low quality because existing development has fragmented the habitat and resulted in human disturbance in the area throughout the goshawk breeding season. Noise disturbance as a result of construction activities could result, but would be negligible because these facilities are in an area that currently receives daily human disturbance during the breeding season. The nearest known goshawk territory is greater than 1 mile from the project area. Therefore, the effects of the Action Alternative would be adverse, local, negligible, and both long- and short-term.

Peregrine falcon: No peregrines are known to nest within 0.5 mile of the project area, and no direct effects on peregrine falcons are expected under the Action Alternative. The Action Alternative would remove or modify approximately 3-4 acres of potential habitat for peregrine falcon prey. However, this loss of habitat would be unlikely to affect peregrine falcons because the change in prey base would be negligible given the small area being affected relative to the available potential habitat for the prey base. The majority of the prey base utilizing the habitat proposed for removal would be displaced to adjacent habitat. Indirect adverse effects on peregrine falcons under the Action Alternative would be negligible, long-term, and local.

Cumulative Impacts (includes future North Rim projects): As described in the vegetation section of this Chapter, modification of habitat in the Bright Angel watershed sub-unit has occurred as a result of past and present activities and modification would result from implementation of future projects. In addition to the approximately 234 acres of habitat that have been impacted by existing development, modification of an additional 18 acres would occur as the result of foreseeable future development and construction-related projects in the North Rim developed area. All of these future projects would occur within the developed area of the North Rim and would be in, or in close proximity to, previously disturbed and developed areas. Up to approximately 120 - 150 large (greater than 12 inches dbh) ponderosa pine trees may need to be removed as a result of implementation of foreseeable future projects. Cumulative impacts would include decreased wildlife security, disturbance to adjacent habitat, and fragmentation in the North Rim developed area. These local, short- and long-term, adverse impacts would be minor because of the widespread availability of montane conifer habitat in the vicinity within the Bright Angel peninsula subwatershed.

Mexican Spotted Owl: Ongoing activities at the North Rim create year-round disturbance in the vicinity. Past and present development has affected potential foraging habitat for MSO in the Bright Angel Peninsula sub-unit. This habitat alteration is unlikely to affect spotted owls because MSO are not known to use areas on the plateau (R.V.Ward, GRCA, pers. Comm.) Prescribed fires are unlikely to affect MSO because none of these prescribed burn areas are in habitat known to be used by spotted owls, and low-intensity fires are not known to affect spotted owl presence or reproduction (Jenness 2000). No future activities are planned on the North Rim that would modify spotted owl critical habitat. Foreseeable future developments in the vicinity of the North Rim could modify potential foraging habitat and result in increased disturbance during construction. However, this additional modification of foraging habitat is unlikely to affect the spotted owl because foraging habitat in affected areas is of marginal quality as the result of the high level of existing development, roads, and human use. Any disturbances to MSO from noise associated with construction activities for this project or any foreseeable future projects would be minimized by mitigation measures such as those specified

earlier in this document. The cumulative effects of the Action Alternative, in combination with other past, present, and reasonably foreseeable future actions, on spotted owls in the Bright Angel Peninsula sub-unit would be negligible to minor, adverse, local, and long-term.

California Condor: Ongoing activities at the North Rim create year-round disturbance in the vicinity and provide the potential for condor/human interactions. Foreseeable future developments at the North Rim would be primarily contained to existing developed areas and would not increase the long-term likelihood of condor/human interactions. Construction activities associated with the Action Alternative and any future developments may attract condors. Mitigation measures, such as those included in this document, would reduce the potential for detrimental interactions between condors and humans for the Action Alternative as well as any foreseeable future actions. The cumulative effects of the Action Alternative, in combination with other past, present, and reasonably foreseeable future actions, on condors would be negligible, short- and long-term, local, and adverse.

Northern Goshawk: Past and present development has altered goshawk nesting and foraging habitat in the Bright Angel Peninsula sub-unit and has created year-round human disturbance in the area. The area affected is minor compared to the amount of available montane conifer habitat in the vicinity. Prescribed burning has been conducted within the watershed sub-unit since 1997 and is planned for additional areas in the next five years. Burned areas support prey species of the goshawk such as woodpeckers. Low-intensity burns are recommended in ponderosa pine and mixed conifer vegetation types to provide habitat for prey species and to reduce the incidence of catastrophic fire (Reynolds et al. 1992). Prescribed burns, therefore, may have minor, local, beneficial effects on northern goshawks. Foreseeable future developments in the vicinity of the North Rim could modify approximately 18 acres of potential foraging habitat and result in increased noise disturbance during construction. This additional modification of habitat is unlikely to affect the northern goshawk because habitat in affected areas is of marginal quality as the result of the high level of existing development, roads, and human use. The cumulative effects of the Action Alternative, in combination with other past, present, and reasonably foreseeable future actions, on northern goshawks in the Bright Angel Peninsula sub-unit would be minor, adverse, local, and short- and long-term.

Peregrine Falcon: The Outlet Fire affected potential habitat for peregrine prey within the Bright Angel Peninsula subwatershed. The intensity of the fire varied, and the rate of vegetation recovery within the fire perimeter also varies. Because burned areas support potential peregrine prey and because these areas will recover, the effect of the fire is not considered a net loss of habitat. Prescribed burning has been conducted within the watershed sub-unit since 1997 and is planned in the next five years. Prescribed fires are generally of small size and low intensity and would not be expected to have measurable effects on the availability of peregrine prey species. In addition to the potential peregrine foraging habitat that has been affected by past development, 19 acres of potential foraging habitat would be affected at the North Rim by foreseeable future developments. None of the foreseeable future developments would affect nesting habitat below the rim or increase use of the area below the rim. The majority of the developments would occur in existing disturbed areas and would not measurably change prey base populations. Cumulative adverse impacts of the Action Alternative, in combination with past, present,

and reasonably foreseeable future actions, would therefore be negligible, local, and long-term.

Kaibab Squirrel: The cumulative impact area for Kaibab squirrels was defined as ponderosa pine areas within the Bright Angel Peninsula subwatershed. In addition to the 93 acres of ponderosa pine habitat that have been affected by past and present developments at the North Rim, approximately 120-150 ponderosa pine greater than 12 inches dbh could be removed by foreseeable future actions on approximately 18 acres. Any foreseeable future actions would occur in close proximity to previously disturbed areas. Cumulative effects of the Action Alternative, along with other past, present, or reasonably foreseeable future actions on Kaibab squirrels would be minor to moderate, adverse, long-term, and local.

Section 7 Consultation: A detailed analysis of the expected effects of this project on Threatened and Endangered species is the subject of a separate Biological Assessment (NPS 2002). The potential for adverse impacts to federally listed species from implementation of the North Rim concessions dormitory and RV park upgrades project, as identified in Alternative B, has been consulted on with the U.S. Fish and Wildlife Service (USFWS). USFWS concurred with the Park's determination that implementation of this project, along with many other construction projects in the Park over the next five years, may affect, but is not likely to adversely affect, the Mexican spotted owl or the California condor or their habitat. Peregrine falcons were also discussed in this document (USFWS letter July 9, 2002).

Impairment: Direct, indirect, and cumulative impacts to the wildlife resource would be negligible as a result of implementing the Action Alternative. These impacts would not result in impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; (2) key to the natural or cultural integrity of the Park; or (3) identified as a goal in the Park's general management plan or other relevant National Park Service planning documents, there would be no impairment of Grand Canyon National Park's wildlife resources or Park values.

Conclusions: The No Action Alternative would not result in changes to general wildlife populations or special status species. Alternative B would result in negligible short-term impacts to general wildlife populations during construction and negligible to minor adverse long-term impacts to special status species. Cumulative long-term adverse impacts would be minor to moderate for general wildlife populations, negligible to minor for MSO, minor for condor, negligible for peregrine falcon, and minor to moderate for goshawk and Kaibab squirrel. For purposes of Section 7 under the Endangered Species Act, Alternative B may affect, but is not likely to adversely affect MSO and condor. FWS concurrence has been received on these determinations (July 9, 2002).

PARK/CONCESSIONS OPERATIONS

Methodology

Impacts to Park operations focus on (1) employee and visitor health and safety, (2) ability to protect and preserve resources, (3) staff size, whether staffing needs to be increased or decreased, (4) existing and needed facilities, (5) communication (e.g., telephones, radio, computers, etc.), and (6) appropriate utilities (sewer, electric, water). Park staff knowledge was used to evaluate the impacts of each Alternative and is based on the current description of Park operations

presented in the Affected Environment section of this document. Definitions for levels of impacts to Park operations efficiency are as follows:

Negligible – a change in operations that is not measurable or perceptible.

Minor – a change in operations that is slight and localized with few measurable consequences.

Moderate – readily apparent changes to park operations with measurable consequences.

Major – a severely adverse or exceptionally beneficial change in park operations.

Alternative A – NO ACTION

Direct/Indirect Impacts. Under the No Action Alternative, maintenance of current facilities and infrastructure would continue by Park and concessioner staff. Indirect impacts would include the increased maintenance required as the existing RV park ages and continues to deteriorate, and there would be a continued shortage of housing for Park staff. Implementing Alternative A would keep the RV park limited to 16 sites and would not allow for an increase in capacity of the RV park for current needs. Alternative A would also not allow for the construction of a new concessioner dormitory in this area. These impacts would be moderate, local, long-term, and adverse.

Alternative B – 44-Unit Dormitory and RV Park Upgrade – Proposed Action

Direct/Indirect Impacts. Construction of a new dormitory and upgrades to the RV park would support the increased needs of the Park/concessioner operation on the North Rim. The new building would provide 44 housing units, while upgrades to the RV park would allow 11 new parking pads for employees living in recreational vehicles. Construction of a new building and upgrades to the RV park would require less maintenance than the existing facilities. The Action Alternative would result in moderate, long-term, local, beneficial effects on Park/concessioner operations.

Cumulative Impacts. All of the foreseeable future actions are designed to have long-term, beneficial impacts on Park/concessioner operations through upgrades to facilities such as the administrative building, housing, offices, utilities, and other infrastructure. These impacts would be local and moderate. Construction activities could have short-term, adverse impacts through disruptions in traffic patterns, utility services, and availability of office space. These impacts would be local and minor to moderate. Use of separate construction inspectors while multiple construction projects are being implemented would minimize the adverse impact to Park/concessioner operations during busy construction periods.

Conclusions. The No Action Alternative would result in moderate, local, long-term, adverse effects on Park/concessioner operations, while the Action Alternative would have moderate, long-term, local, beneficial effects on Park/concessioner operations.

Chapter 5 - CONSULTATION / COORDINATION

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Xanterra

Jim Bundrick, Xanterra Maintenance

SELECTED REFERENCES - Literature Cited

Executive Orders

Executive Order 11988 (Floodplain Management)

Executive Order 12898 (Environmental Justice)

National Park Service, U.S. Department of the Interior

Director's Orders

DO-2 (Planning Process Guidelines)

DO-12 (Conservation Planning, Environmental Impact Analysis, and Decision Making)

DO-28 (Cultural Resource Management)

US Federal Government

Resource Conservation Recovery Act

36 CFR 800.11

40 CFR, Part 503

1864 Act of Congress (13 Stat. 325)

1890 Act of Congress (26 Stat. 650)

1906 Joint Resolution of Congress (34 Stat. 831)

1955 Federal Air Quality Law

1963 Clean Air Act, as amended

1964 Wilderness Act

1966 National Historic Preservation Act

1969 National Environmental Policy Act (NEPA)

1973 Endangered Species Act, as amended

1977 Clean Water Act

1979 Archeological Resources Protection Act

1984 Archaeological Resources of Grand Canyon National Park (Multiple Resources Partial Inventory: Prehistoric and Historic Archaeological Sites, Historic and Architectural Properties. Draft.

1990 Native American Graves Protection and Repatriation Act

NPS-77 (Natural Resources Management)

1995a Draft General Management Plan and Environmental Impact Statement, Grand Canyon National Park. Denver Service Center.

1995b Final General Management Plan and Environmental Impact Statement, Grand Canyon National Park. Denver Service Center.

1995c General Management Plan, Grand Canyon National Park. Denver Service Center.

1995d Record of Decision for General Management Plan Environmental Impact Statement. On file at Denver Service Center.

1995e "Programmatic Agreement among the National Park Service, the Arizona State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding the Draft General Management Plan/Environmental Impact Statement, Grand Canyon National Park, Arizona."

Makarick, Lori. 2001. Personal correspondence. List of documented species on North Rim.

EA Distribution

The following groups received a hard copy of the EA for a 30 day public review comment period. The EA was also sent to four members of the general public who requested hardcopies. The public scoping letter, the letter announcing the availability of the EA and the EA are posted on the GRCA website at http://www.nps.gov/grca/compliance.

Arizona Game and Fish Department, Phoenix Office

Arizona Game and Fish Department, Flagstaff Office

Sedona Public Library

Washington County Library, St. George, Utah

Fredonia Public Library

Flagstaff Public Library

Grand Canyon Community Library

Phoenix Public Library

Williams Public Library

Northern Arizona University, Cline Library

Kanab City Library

US Fish and Wildlife Service, Phoenix Office

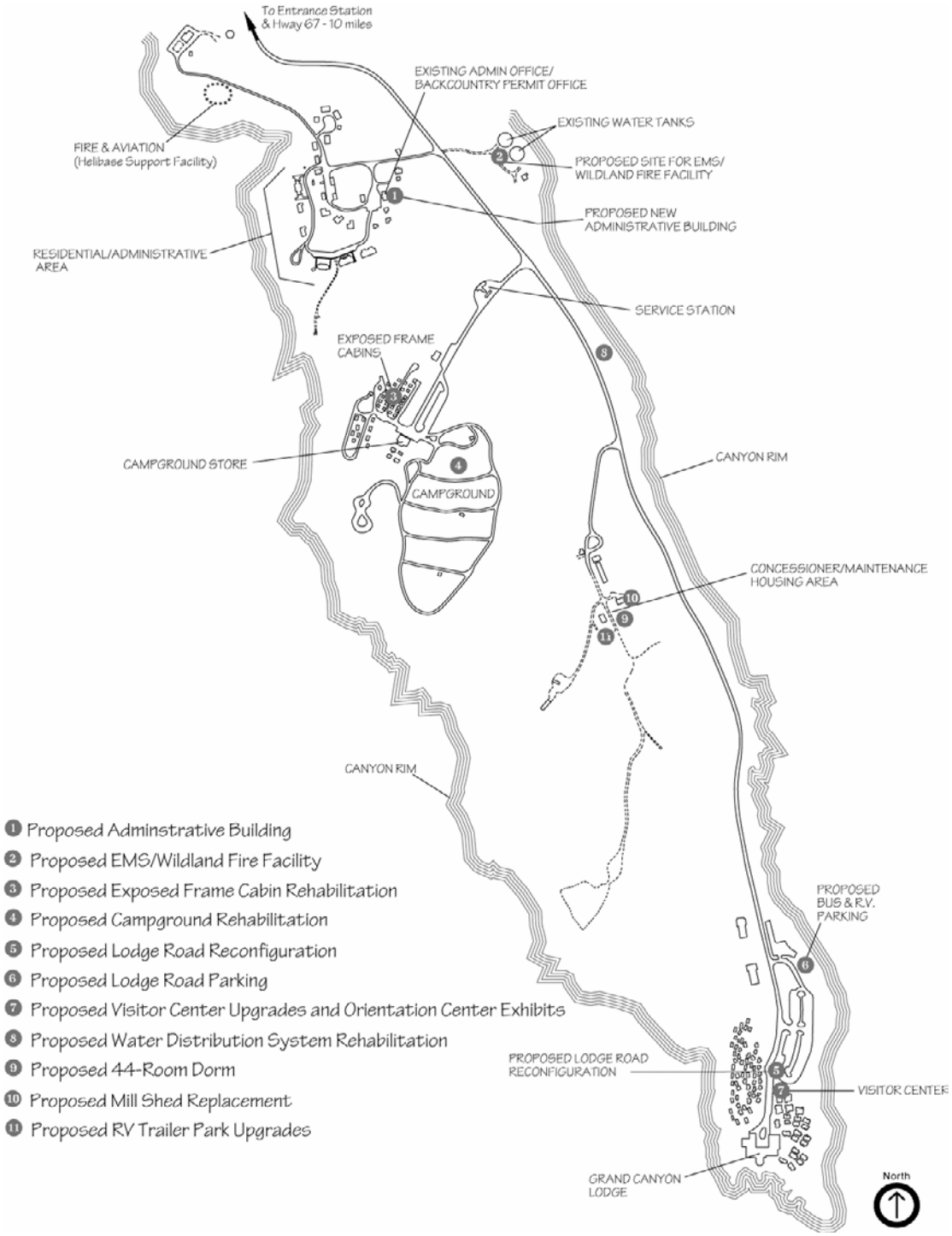
US Fish and Wildlife Service, Flagstaff Office

Navajo Nation

Hopi Tribe

APPENDIX A

Vicinity Map Location – Figure 1



APPENDIX B

List of North Rim Exotic Plants and Noxious Weeds

Documented Exotic Plant Species North Rim, Grand Canyon National Park* Makarick L. 2001			
Scientific Name	**Family**	**Common Name**	**Urgency Ranking/**
Agrostis stolonifera	Poaceae	Red top grass	High
Avena fatua	Poaceae	Wild oat	Medium
Bromus inermis	Poaceae	Smooth brome	High
Bromus tectorum	Poaceae	Cheatgrass	Medium
Chenopodium album	Chenopodiaceae	Lambsquarter	Medium
Chrysanthemum leucanthrum	Asteraceae	Oxeye daisy	High
Conioselinum scopulorum	Apiaceae	Hemlock parsley	
Cynoglossum officinale	Boraginaceae	Houndstongue	High
Dactylis glomerata	Poaceae	Orchard grass	High
Elymus repens	Poaceae	Quackgrass	Medium
Erodium cicutarium	Geraniaceae	Filaree	Medium
Galium aparine	Rubiaceae	Bedstraw	Medium
Lactuca serriola	Asteraceae	Prickly lettuce	Low
Linaria dalmatica	Scrophulariaceae	Dalmatian toadflax	High
Lolium perenne	Poaceae	Perennial ryegrass	Medium
Malva neglecta	Malvaceae	Common mallow	Medium
Marrubium vulgare	Lamiaceae	Horehound	High
Melilotus alba	Fabaceae	Alfalfa	Low
Melilotus officinalis	Fabaceae	Annual sweet clover	Medium
Phleum pratense	Poaceae	Common timothy	Medium
Plantago lanceolata	Plantaginaceae	Buckhorn plantain	Medium
Poa compressa	Poaceae	Canada bluegrass	Medium
Poa pratensis	Poaceae	Kentucky bluegrass	Medium
Polypogon monspeliensis	Poaceae	Rabbitfoot grass	Medium
Prunella vulgaris	Lamiaceae	Healall	Medium
Rumex acetosella	Polypogonaceae	Sheep sorrel	Medium

Sorghum halepense	Poaceae	Johnson grass	High
Stellaria media	Caryophyllaceae	Common chickweed	Medium
Taraxacum officinale	Asteraceae	Common dandelion	Medium
Tragopogon dubius	Brassicaceae	Yellow salsify	Low
Trifolium repens	Fabaceae	White clover	Medium

Potential Invasive Exotic Plant Species
North Rim, Grand Canyon National Park and Surrounding Areas* Makarick L. 2001

Scientific Name	Family Name	Common Name
Acroptilon repens	Asteraceae	Russian knapweed
Aegilops cylindrica	Poaceae	Jointed goatgrass
Alternanthera philoxeroides	Amaranthaceae	Alligator weed
Alhagi maurorum	Fabaceae	Camelthorn
Ailanthus altissima	Simarubaceae	Tree of heaven
Cardaria chalepensis	Brassicaceae	Lens podded hoary cress
Cardaria draba	Brassicaceae	Whitetop
Cardaria pubescens	Brassicaceae	Hairy whitetop
Carduus acanthoides	Asteraceae	Plumeless thistle
Carduus nutans	Asteraceae	Musk thistle
Cenchrus sp.	Asteraceae	Sandburs
Centaurea calcitrapa	Asteraceae	Purple starthistle
Centaurea diffusa	Asteraceae	Diffuse knapweed
Centaurea iberica	Asteraceae	Iberian starthistle
Centaurea maculosa	Asteraceae	Spotted knapweed
Centaurea solstitialis	Asteraceae	Yellow starthistle
Centaurea squarrosa	Asteraceae	Squarrose knapweed
Coronopus squamatus	Brassicaceae	Creeping wartcress, greater swinecress
Cucumis melo	Cucurbitaceae	Dudaim melon, Queen Anne's melon
Cuscuta sp.	Convolvulaceae	Dodder
Cynodon dactylon	Poaceae	Bermuda grass
Drymaria arenarioides	Caryophyllaceae	Lightningweed, sandwort drymary
Eichhornia azurea	Hydrophyllaceae	Anchored water hyacinth
Eichhornia crassipes	Hydrophyllaceae	Floating water hyacinth
Elymus repens	Poaceae	Quackgrass
Euphorbia esula	Euphorbiaceae	Leafy spurge
Heliathus ciliaris	Asteraceae	Texas blueweed
Hydrilla verticillata	Hydrocharitaceae	Waterthyme
Ipomoea triloba	Convolvulaceae	Three-lobed morning glory
Isatis tinctoria	Brassicaceae	Dyers woad
Lepidium latifolium	Brassicaceae	Whitetop
Lythrium salicaria	Lythraceae	Purple loosestrife
Medicago polymorpha	Fabaceae	Burclover
Nassella trichotoma	Poaceae	Serrated tussock
Onopardum acanthium	Asteraceae	Scotch thistle
Orobanche ramosa	Orobanchaceae	Branched broomrape
Panicum repens	Poaceae	Torpedo grass
Peganum harmala	Zygophyllaceae	African rue
Pennisetum clandestinum	Poaceae	Kikuyu grass

Portulaca oleracea	Portulacaceae	Common purslane
Rorippa austriaca	Brassicaceae	Austrian fieldcress
Salvia aethiopis	Lamiaceae	Mediterranean
Senecio jacobaea	Asteraceae	Tansy ragwort
Solanum carolinense	Solanaceae	Carolina horsenettle
Sonchus arvensis	Asteraceae	Perennial sowthistle
Stipa brachychaeta	Poaceae	Puna grass
Striga spp.	Scrophulariaceae	Witchweed
Taeniatherum caput-medusae	Poaceae	Medusahead
Trapa natans	Trapaceae	Water-chestnut
Verbascum thapsus	Scrophulariaceae	Common mullein

APPENDIX C

Foreseeable Future Actions on the North Rim

1. **North Rim Administrative Building –**This project would remove the existing administration building (a trailer) and construct a larger building at essentially the same site, would renovate the existing parking area and continue to use the existing roads for access to the new building. The new building would be approximately 2,467 square feet and would support the backcountry permit system, visitor contact services, public restroom, and administrative offices. No tree removal would be required for this project, due to its location on the existing footprint of the current building and its associated parking area. The project area is relatively small, is between two residential areas and within the headquarters area where development has occurred and continues to occur. The site is in a small opening in a forest consisting mainly of ponderosa pine and some scattered aspen. Disturbance for this project is estimated at 1 acre. No trees greater than 12 inches dbh would be removed for this project.

2. **North Rim Emergency Services/Wildland Fire Facility.** A new emergency services/wildland fire facility would be built in the vicinity of the water tanks. The facility would occupy approximately 10,590 square feet and would have EMS facilities grouped at one end of the building, wildland fire facilities at the other, and shared spaces between. EMS facilities would include storage areas for emergency services vehicles (fire engine, ambulance, patrol cars, suburban), caches for EMS and search and rescue equipment, men's and women's locker rooms, holding cells, and office space. The wildland fire facilities would include storage areas for vehicles, a fire equipment cache, and office, laboratory, and work spaces. Shared facilities would include offices, a conference room, and maintenance facilities. Paved area for parking and roads would occupy approximately 0.9 acres. All utilities would be connected to the facility underground. Trenching for utilities would result in disturbance to approximately 0.14 acres. The total area of ground disturbed at the site would be approximately 2 acres and approximately 0.6 acres would be revegetated following construction. Approximately 74 trees (both ponderosa pine and aspen) greater than 12 inches dbh would be removed for this project.

3. **Exposed Frame Cabin Rehabilitation –** Twenty-six one-room cabins, a shower facility, and a laundry facility in the North Rim Inn and Campground Historic District would be restored, rehabilitated, or reconstructed and would be used to house the wildland fire crew seasonally. Project actions will be limited to the buildings themselves and the immediate surroundings and would not require ground disturbance or vegetation removal. No trees greater than 12 inches dbh would be removed for this project.

4. **North Rim Campground Rehabilitation –** The preferred Alternative for this project includes removal of the existing entrance kiosk and constructing a new campground registration building essentially within the existing parking area, resurfacing the roads within the campground, restroom rehabilitation, installation of a 6-stall restroom and installation of one prefabricated vault toilet at the group site to replace the existing outhouse. Disturbance for this project is estimated at 0.75 acres. Approximately 4 trees greater than 12 inches dbh would be removed for this project.

5. **North Rim Lodge Road Reconfiguration –** This project would change public access routes to the Lodge. The terminus of the main road would be reconfigured to allow tour busses to turn around and discharge and pick up guests at this terminus, and to restrict passenger vehicle access to the Lodge. The existing road segment between the parking area and the Lodge would be converted primarily to pedestrian use. Very little new ground disturbance would result from this project, as most work is confined to existing roadways and parking areas. Disturbance for this project is estimated at 0.5 acres. No trees greater than 12 inches dbh would be removed for this project.

6. **Lodge Road Parking**. The main parking area would be reconfigured to allow for additional bus/RV parking. Disturbance for this project is estimated at 0.5 acres. Approximately 13 trees greater than 12 inches dbh would be removed for this project.

7. **Visitor Center Upgrades and Orientation Center Exhibits –**Improper drainage beneath the visitor center would be repaired, the building exterior would be refinished, solar panels would be added to the roof, native vegetation landscaping would be added to the site, and repair and rehabilitation of the existing walkways around the building would be done. A wayside exhibit plan has been created by the park for the plaza area adjacent to the visitor center. Two orientation panels and three to four interpretive panels would be installed as well as a flagpole. Low-level outdoor lighting may be installed as well, but the park is still evaluating the necessity and feasibility of this component. All work would occur in areas already developed and that receive high visitor use in the summer season. No trees greater than 12 inches dbh would be removed for this project.

8. **North Rim Water Distribution System Rehabilitation –**This project involves the upgrading of the existing water distribution system, including the addition of fire hydrants and hose houses where necessary. The majority of the existing potable water lines would be dug up and replaced. A pumping station would be upgraded to boost pressure to the administrative area and the campground area. Work would be conducted in previously disturbed areas, along existing utility corridors, many of which are along roads. Tree removal would be minimal, consisting primarily of small seedlings and saplings that have grown up along the utility corridor. Approximately 2.3 miles of water line would be replaced during the course of this project. Disturbance for this project is estimated at 2.5 acres. Approximately 10 trees greater than 12 inches dbh would be removed for this project.

9. **North Kaibab Trailhead Restroom –**The existing portable toilet in the upper parking area island would be replaced with a pair of prefabricated vault toilets at the same location. It is likely some rock excavation may be necessary for vault installation. Site work would include removal and replacement of curbing, accessible walkway placement and installation of accessible ramps to the toilets. No trees would need to be removed for this project. The project area is a disturbed site at the existing parking area. Disturbance for this project is estimated at 0.25 acres. No trees greater than 12 inches dbh would be removed for this project.

10. **Widforss Trailhead Restroom –** No toilet exists at this location. A single prefabricated vault toilet would be constructed at the far end of the parking area in a disturbed area. It is likely some rock excavation may be necessary for vault installation. Site work would include some grading and drainage improvements, and construction of a small drylaid stone wall behind the building. No trees would need to be removed for this project. The project area is an existing parking area. This is a small project resulting in little ground disturbance and is expected to be of short duration (2-5 days for installation). Disturbance for this project is estimated at 0.25 acres. No trees greater than 12 inches dbh would be removed for this project.

11. **North Rim Firing Range Rehabilitation –** This project entails lead abatement at the firing range. The proposal includes measures to remove lead from the site and construct a "bullet-catching" backstop that would eliminate lead contamination on the site in the future. Proposed actions would also include rehabilitation of the existing structures (firing lanes, etc.) The project area is in a quarry, is a disturbed site, and has been in use for many years as a firing range. The lead abatement portion of the project is considered heavy construction, due to the probability that some large pieces of equipment would be necessary to remove the contaminated soil and bring in new soil. Some trees may need to removed, depending on the level of lead abatement necessary, but tree removal is not expected to be extensive and would be confined to the range and areas adjacent. Disturbance for this project is estimated at 2 acres. No trees greater than 12 inches dbh would be removed for this project.

12. **Arizona Trail –** This project would construct a small segment of new trail between Forest Service Land and the Park boundary to connect two existing segments of the Arizona Trail. New trail construction would be limited to approximately 1.5 miles out of an approximately 11 mile segment between the Park boundary and existing roads and utility corridors. Only ¾ of a mile of trail would be constructed within the park. The remaining ¾ mile is on National Forest land. Tree removal and ground disturbance would be necessary for the segment near the entrance station. Disturbance for this project is estimated at 1/2 acre. Approximately 6 trees greater than 12 inches dbh would be removed for this project. This project does not occur within the Bright Angel watershed sub-unit.

13. **North Rim Entrance Station Rehabilitation –** *This project is adjacent to but not within the Bright Angel peninsula subwatershed.* This project would rehabilitate the historic entrance station and surrounding area. A specific proposal has not yet been developed fully, but actions that are likely to be included in the project are: reconfiguration of the road and parking area, replacing the entrance sign and gate, installation of visitor orientation signs, constructing a restroom, and rehabilitating the existing historic building including upgrading the security and HVAC systems. The North Rim entrance station is located in an open meadow, although trees are within close proximity to the entrance station in some areas. Tree removal, at this early stage in project planning, is expected to be minimal. The majority of the work would be focused on the upgrading the existing development at the entrance station and would not result in substantial new ground disturbance outside of the immediate developed area. Disturbance for this project is estimated at 2 acres. Approximately 5 trees greater than 12 inches dbh would be removed for this project. This project does not occur within the Bright Angel watershed sub-unit.

14. **Repaving Cape Royal Road to Point Imperial Spur –** This road maintenance project would include pulverizing existing asphalt and overlaying new asphalt. Work would total approximately 6 miles of road. Widening of road will be required at some culvert locations where the road is narrower than elsewhere. Incidental improvements to guardrails and drainage will be needed. The surrounding habitat along some sections of this road is mixed conifer. Much of this area was burned in the Outlet Fire. Implementation of the project may include some vegetation disturbance where slight widening is necessary near culverts. It is unlikely this would require tree removal. If tree removal is necessary, it is likely these trees would be small (seedling/sapling size) and would be adjacent to the existing road corridor. Disturbance for this project is estimated at 7 acres, approximately 5 acres of which occur within the Bright Angel watershed sub-unit. Approximately 5 trees greater than 12 inches dbh would be removed for this project.

15. **Prescribed Fire Future Plans –** Prescribed burning, as part of a five year prescribed burning plan, is planned for approximately 1,000 acres of the Bright Angel watershed sub-unit in 2004 and approximately 500 acres in 2006, for a total of 1,500 acres within the next five years.

18. **Fire Sprinkler Systems in 13 North Rim Buildings** – This project would add structural fire sprinkler systems to 13 buildings on the North Rim, equating to approximately 15,000 square feet of protected floor space. At this time, none of these buildings have sprinkler systems and all need protection. Eight of the structures are listed on the National Register of Historic Places and all 13 are located within the administrative area of the North Rim developed zone. Structures to be sprinkled include 5 non-historic residences, 7 historic residences and 1 historic office building: the ranger operations office (building 119). Project actions will be limited to the buildings themselves and the immediate surroundings and would not require ground disturbance or vegetation removal. No trees greater than 12 inches dbh would be removed for this project.

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APPENDIX D

List of Threatened, Endangered, Proposed and Candidate Species, US Fish and Wildlife Service